

Genesis Key Performance Indicators for KC Wastewater Treatment Division

Corporate Indicators

1. Total Cost to Produce (Manufacture)

This indicator is a compilation of all the costs that it takes to produce a product. It is used to figure the profit margin since the difference between this cost and the sales revenue is profit. The reason this is of importance to the maintenance function is it makes up a percentage of this cost. This figure is further analyzed in the financial indicators.

2. Total Cost of Occupancy

This is a facility measure that is a compilation of all the costs it takes to occupy a facility. This cost is important to the maintenance function, since it makes up a percentage of this cost. This figure is further analyzed in the financial indicators.

3. Return on Net Assets

This is the profit earned compared to the net value of the company assets. The impact that maintenance has on profits is a major factor in calculating the return. This will be highlighted in the financial indicators.

4. Return on Fixed Assets

This is the profit earned compared to the net value of the fixed company assets. The impact that maintenance has on profits is a major factor in calculating the return. This will be highlighted in the financial indicators.

Financial Indicators

1. Maintenance Cost per Unit processed, produced, or manufactured

This is the maintenance costs divided by the volume of production. This is a common measure of maintenance performance, although it is not necessarily one of the best. The production volumes vary for reasons not under the control of the maintenance department. If the maintenance department is held accountable for this indicator, then poor decisions will be made related to the maintenance strategies. The organization will be upsized, downsized and otherwise impacted due to the fluctuations of the indicator. This indicator is good for a broad, trending indicator, but should never be used as a sole performance indicator.

2. Maintenance costs as a percentage of total process, production, or manufacturing costs

This indicator is a more accurate measure for the costs of manufacturing is a total calculation, not a per unit calculation. Maintenance will be a percentage of the cost, but is generally fixed. So this makes the indicator more accurate for the financial measure of maintenance. It is easy to use the percentage of this cost that is maintenance to trend. If it increases, then the efficiency and effectiveness indicators should show what maintenance area caused the increase.

3. Maintenance Costs as a percentage of a Sales Dollar

This also is an accurate measure for the percentage is usually fixed. This also makes this indicator easy to use to trend any increases over time. If the percentage of maintenance costs increase, then the efficiency and effectiveness indicators should show what maintenance area caused the increase.

4. Maintenance Cost per Square Foot Maintained

This also is an accurate measure for facilities, since the cost is usually fixed. This also makes this indicator easy to use to trend any increases over time. If the percentage of maintenance costs increase, then the efficiency and effectiveness indicators should show what maintenance area caused the increase.

5. Maintenance cost per estimated replacement value of the plant or facility assets

This is becoming almost a standard indicator. This is an accurate measure for plants and facilities, since the cost is usually fixed. This also makes this indicator easy to use to trend any increases over time. If the percentage of maintenance costs increase, then the efficiency and effectiveness indicators should show what maintenance area caused the increase.

6. Stores investment as a percentage of estimated replacement value

This also is becoming a standard for the measure for stores investment. This makes this indicator easy to use to trend any increases over time. If the percentage of stores costs increase, then the efficiency and effectiveness indicators should show what maintenance or stores function caused the increase.

7. Value of asset maintained per maintenance employee

This also is another measure for plants and facilities, since the asset cost is usually fixed. This also makes this indicator easy to use to trend any increases over time. If the value of the asset maintained shows a decrease, then the efficiency and effectiveness indicators should show what maintenance area caused the decrease.

8. Contractor costs as a percentage of total maintenance costs

This is an indicator that is useful for trending contractor costs as a percentage of total maintenance costs. If the costs remain stable, then the contractor usage is stable. If an increase or decrease is indicated then the efficiency and effectiveness indicators should highlight the reason for the change.

Efficiency and Effectiveness Performance Indicators

- Downtime Caused By Breakdowns
- Total Downtime Expressed as a %
- Man-hours spent on Emergency Jobs
- Total Man hours worked Expressed as a %
- Direct cost of Breakdown Repairs
- Total direct cost of maintenance Expressed as a %

Desired Equipment Uptime – Downtime
Desired Equipment Uptime Expressed as a %

Hours worked as Overtime
Total hours worked expressed as a percentage

- Maintenance work orders on hold awaiting parts
- Total Number of Maintenance Work Orders

Percentage of Work Distribution by Type of Work Order

<u>Emergency Orders</u>	<u>Preventive Work Orders</u>	<u>Corrective W.O.</u>
Total Work Orders	Total Work Orders	Total Orders

Total downtime attributed to operational errors
Total downtime
- expressed as a percentage

Total downtime attributed to maintenance errors
Total downtime
- expressed as a percentage

Estimated lost time due to lack of knowledge or skills
Total time worked
- expressed as a percentage

Maintenance Rework due to lack of knowledge or skills
Total Maintenance work
- expressed as a percentage

Maintenance related equipment downtime – current period
Maintenance related equipment downtime – same period previous year

Actual Equipment Throughput current period
Actual Equipment Throughput – same period previous year

Current Maintenance Costs

Maintenance Costs prior to Predictive Program
– expressed as a percentage

Savings attributed to the RCM program

- Equipment Uptime
 - Equipment Capacity
 - Maintenance labor
- Percentage reduction in Routine Maintenance Hours

OSHA Citations / Notices Per Inspection Current Year

OSHA Citations / Notices per Inspection – Previous Year

EPA Citations / Notices Per Inspection Current Year

EPA Citations / Notices per Inspection – Previous Year

ISO-9000 Notices of non-conformance Per Inspection - Current Year

ISO-9000 Notices of non-conformance Per Inspection – Previous Year

Overall Equipment Effectiveness

All downtime

Availability = scheduled time - This should be at least 90%

Actual output for scheduled time

Performance Efficiency = Design output for scheduled time
This should be at least 95%

Defects or rework

Quality Rate = Total production This should be at least 99%

$90\% \times 95\% \times 99\% = 85\%$

Tactical Performance Indicators

Preventive Maintenance

- Preventive Maintenance Tasks Completed
Preventive Maintenance Tasks Scheduled -
Expressed as a percentage
- Breakdowns caused by items that should have been
Inspected, serviced, or a part of the PM program
- Total number of breakdowns
 - Expressed as a %

Inventory and Procurement

- Total Annual Dollar Amount of Stores Usage
- Total Inventory Valuation
 - Expressed as a Decimal number
- Total Number of Orders not filled on Demand
Total Number of Orders Requested
expressed as a percentage

Total Number of Items filled on Demand
Total Number of Items Requested
expressed as a percentage

- Total Number of Rush Purchase orders
- Total Number of Purchase Orders
 - expressed as a percentage

Work Orders & Planning / Scheduling

- Maintenance Work Orders Planned
Total Work Orders Received
expressed as a percentage
- Maintenance Hours Scheduled
- Total Maintenance Hours Worked
 - - expressed as a percentage
- Total Hours Estimated on Scheduled Work Orders
- Total Hours Charged to Scheduled Work Orders
 - - Expressed as a percentage
- Number of W.O.s Completed greater than 20% of estimated Labor
- Total Number of Maintenance Work Orders

Number of W Os Completed exceeding the estimated Material Costs by (+/-) 20%

- Total Number of Maintenance Work Orders
- Work orders overdue
- Total work orders expressed as a percentage

Computerized Maintenance Management Systems

- Total Maintenance Labor Costs in CMMS
- Total Maintenance Labor Costs (From Accounting)
 - expressed as a percentage
- Total Maintenance Material Costs in CMMS
 - Total Maintenance Material Costs (From Accounting)
 - expressed as a percentage
- Total Maintenance Contracting Costs in CMMS
 - Total Maintenance Contracting Costs (From Accounting)
 - expressed as a percentage
- Total Maintenance Costs Charged to Individual Equipment Items
- Total Maintenance Costs (From Accounting) expressed as a percentage

Operations Involvement

Hours of Preventive Maintenance performed by Operators

- Total Preventive Maintenance Hours
- expressed as a percentage

Hours of maintenance activities performed by operators – current period

- Hours of maintenance activities performed by operators
- same period previous year

Hours of equipment improvement performed by operators

- Total Hours worked by operators
- expressed as a percentage

RCM

Number or equipment breakdowns

- Total Hours in time period
- expressed as a ratio

Number of repetitive equipment failures
Total number of equipment failures
– expressed as a percentage

Functional Maintenance Indicators:

Preventive Maintenance

- Number of PM's overdue
Total number of PM's outstanding - Expressed as a percentage
- Estimated PM Task Cost
Actual PM Task Costs Expressed as a percentage
- Total number of Work Orders generated from PM Inspections
Total Number of Work Orders generated
Expressed as a %

Inventory and Procurement

- Inactive Stock Line Items
Total Stock Line Items Expressed as a Percentage
- Total Dollar Value of Maintenance Spare
- Parts in a Controlled Stores Location
Total Inventory on hand (Controlled + Uncontrolled “estimated”) - expressed as a percentage
- Total Number of Single Line Item Purchase Orders
- Total Number of Purchase Orders
- Maintenance Material Costs charged to a credit card
- Total Maintenance Materials Costs
 - expressed as a percentage

Work Orders

- Maintenance Labor Costs on Work Orders
- Total Maintenance Labor Costs
 - expressed as a percentage
- Maintenance Material Costs on Work Orders
- Total Maintenance Material Costs
 - expressed as a percentage
- Maintenance Contract Costs on Work Orders
Total Maintenance Contract Costs
expressed as a percentage
- Maintenance Downtime on Work Orders

- Total Maintenance Downtime Charged expressed as a percentage
- Maintenance Labor Cost charged to Standing Work Orders
- Total maintenance Labor Costs
 - expressed as a percentage
- Materials Costs Charged to a Standing Work Order
- Total Maintenance Materials Costs
 - expressed as a percentage
- Total charges for an Equipment Item written to a standing work order
- Total charges for a Specific Equipment item
 - expressed as a percentage

Planning and Scheduling

- Maintenance Labor Costs Planned
Total Maintenance Labor Costs
expressed as a percentage
- Maintenance Material Costs Planned
- Total Maintenance Materials Costs
 - expressed as a percentage

CMMS

- Total Number of Equipment Items in CMMS
- Total Number of Equipment items in the Plant
- Total Number of Part Items in CMMS
- Total Number of Part Items in the Plant
 - expressed as a percentage
- Total Number of Preventive Maintenance Tasks
Total Number of Equipment Items in the Plant X 3
– expressed as a percentage
- Number of Maintenance Employees or Full Time Equivalents
Number of Supervisors or Coaches
- Number of Maintenance Employees or Full Time Equivalents
- Number of Planners
- Total number of Maintenance Overhead personnel
Total Hourly Maintenance personnel
expressed as a ratio

Training

Total training dollars

Total number of employees - expressed as a ratio

– Technical

Total training dollars

Total number of employees - expressed as a ratio

– Interpersonal (Soft Skills)

Total training dollars

Total number of employees - expressed as a ratio

Total Number of Training Employees

Total number of Maintenance employees - expressed as a ratio

Total training dollars

Total plant payroll - expressed as a percentage

Predictive Maintenance

– For Hours

Hours of predictive maintenance activities

Total maintenance

– expressed as a percentage

- For costs

Predictive maintenance costs

Total maintenance costs

– expressed as a percentage

Reliability Centered Maintenance

Number of failures where root cause analysis was performed

Total number of equipment failures

– expressed as a percentage

Number of Preventive Maintenance Tasks Audited

Total Number of Maintenance Tasks

– expressed as a percentage

Number of Predictive Maintenance Tasks Audited

Total Number of Predictive Maintenance Tasks

– expressed as a percentage

Total Productive Maintenance

Critical Equipment items covered by design studies

Total number of Critical Equipment Items

Expressed as a percentage

Critical Equipment items covered by 5 S Activities

Total number of Critical Equipment Items

Expressed as a percentage

Number of Critical Equipment Maintenance Tasks Audited

Total Number of Critical Equipment Maintenance Tasks

– expressed as a percentage

Number of Critical Equipment Major spare parts Audited

Total Number of Critical Equipment Major spare parts

– expressed as a percentage

Number of Critical Equipment routine spare parts policies Audited

Total Number of Critical Equipment routine spare parts

– expressed as a percentage